

Amendments to the CLAIMS

1. (Currently Amended) A semiconductor structure comprising:

a silicon substrate;

a silicon germanium ~~component~~ layer formed on the silicon substrate;

an intermediate layer formed on the silicon germanium ~~component~~ layer; and

a gallium nitride material region formed on the intermediate layer, the gallium nitride material region comprising an intrinsic gallium nitride material layer formed on the intermediate layer and an aluminum gallium nitride layer formed on the gallium nitride material layer.

2-11. (Canceled)

12. (Previously Presented) The semiconductor structure of claim 1, wherein the intermediate layer is compositionally graded.

13. (Currently Amended) The semiconductor structure of claim 12, wherein the composition of the silicon germanium layer is graded.

14. (Currently Amended) The semiconductor structure of claim 13, wherein the germanium concentration of the silicon germanium layer is increased in a direction away from a the substrate.

15. (Currently Amended) The semiconductor structure of claim 1, wherein the silicon germanium layer ~~component~~ has a monocrystalline structure.

16. (Currently Amended) The semiconductor structure of claim 1, wherein the silicon germanium layer ~~component~~ has a thermal expansion coefficient within +/- 25% of the thermal expansion coefficient of the gallium nitride material layer.

17-18. (Cancelled)

19. (Previously Presented) The semiconductor structure of claim 1, wherein the gallium nitride material layer comprises an $\text{Al}_x\text{In}_y\text{Ga}_{(1-x-y)}\text{N}$ alloy.
20. (Original) The semiconductor structure of claim 19, wherein the sum of $(x + y)$ is less than 0.2.
21. (Previously Presented) The semiconductor structure of claim 1, wherein the gallium nitride material layer comprises GaN.
22. (Previously Presented) The semiconductor structure of claim 1, wherein the gallium nitride material layer has a crack level of less than $0.005 \mu\text{m}/\mu\text{m}^2$.
- 23-29. (Cancelled)
30. (Original) A semiconductor structure comprising:
a silicon substrate;
a silicon germanium layer formed on the silicon substrate; and
a gallium nitride material layer formed on the silicon germanium layer.
- 31-38. (Canceled)
39. (Currently Amended) The semiconductor structure of claim 1, wherein the intermediate layer is formed directly on the silicon germanium layer ~~component~~.
40. (Previously Presented) The semiconductor structure of claim 1, wherein the gallium nitride material layer is formed directly on the intermediate layer.
41. (Previously Presented) The semiconductor structure of claim 1, wherein the intermediate layer is formed of aluminum nitride, an aluminum nitride alloy, or a gallium nitride alloy.

42. (Previously Presented) The semiconductor structure of claim 1, wherein the intermediate layer is formed of aluminum nitride.

43. (Previously Presented) The semiconductor structure of claim 30 further comprising an intermediate layer formed between the silicon germanium layer and the gallium nitride material layer.

44. (Cancelled)

45. (New) The semiconductor structure of claim 1, wherein the aluminum gallium nitride layer comprises between 10% and 40% by weight aluminum.

46. (New) The semiconductor structure of claim 1, wherein each layer of the gallium nitride material region is intrinsic.

47. (New) The semiconductor structure of claim 1, wherein the gallium nitride material region further comprises a GaN layer formed on the aluminum gallium nitride layer.